REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1 and 3-9 are presented in the present application. Claims 1, 3 and 4 are amended, Claim 2 is cancelled without prejudice and Claims 5-9 are added by the present response.

In the outstanding Office Action, the specification was objected to; Claims 1-4 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite; Claims 1-2 and 4 were rejected under 35 U.S.C. § 102(b) as anticipated by Skowronski et al. (U.S. Patent No. 6,170,251, herein "Skowronski"); and Claims 1-4 were rejected under 35 U.S.C. §102(b) as anticipated by Horii et al. (U.S. Patent Application Publication No. 2001/0022078, herein "Horii").

Regarding the objection to the specification, the specification has been amended as suggested by the outstanding Office Action. No new matter has been added. Thus, it is respectfully requested this objection be withdrawn.

Regarding the rejection of Claims 1-4 under 35 U.S.C. §112, second paragraph, Claim 2 has been cancelled and Claims 1, 3, and 4 have been amended as suggested by the outstanding Office Action. No new matter has been added.

Two inquiries noted in the outstanding Office Action on page 6, numbered paragraphs 10 and 11 are addressed now. First, the examiner asks what degrees are used in Claim 4. It is noted that the standard usage of word "degrees" when

characterizing a rotation, i.e., the rotation of the vanes, refers to a rotation in a plane which is customarily between 0 and 360 degrees. Thus, it is believed that the word "degrees" used in the context of the rotation of the vanes is appropriate.

Second, the examiner considers that it is unclear whether an engine can operate at 0 to 5% of the flow rate. It is noted that no engine is recited in the claims. Also, it is noted that Claim 4 recites a flow rate (W2) for a bleed system being between 0 to 5%. The flow rate W2 is removed from the compressor and not provided to the combustor and turbine but used for other purposes. It is believed that these explanations answer the examiner's questions.

Therefore, it is respectfully submitted that amended Claims 1, 3, and 4 overcome the noted rejection and this rejection should be withdrawn.

Independent Claim 1 has been amended to more clearly recite how the at least one calculation unit is configured to work. The claim amendments find support in the originally filed Claim 2 and in the specification, for example, at page 16, lines 4-12, and Figure 5. No new matter is believed to be added. New dependent Claims 5-9 have been added to set forth the invention in a varying scope and Applicants submit that the new claims are supported by the originally filed specification. More specifically, new Claim 5 finds support at page 9, lines 14-22, Claim 6 finds support at page 9, line 23 to page 10, line 19, new Claim 7 finds support at page 10, line 20 to page 11, line 5, Claim 8 finds support at page 10, line 20 to page 11, line 2, and Claim 9 finds support at page 15, lines 3-8. These claims are believed to be allowable over the applied art for the

reasons discussed below with regard to independent Claim 1, from which the new claims depend.

The outstanding rejections on the merits of the claims are respectfully traversed based on the above noted amendments and for the following reasons.

Briefly recapitulating, amended Claim 1 is directed to a system for controlling and optimizing emissions of a catalytic combustor in a gas turbine. The system includes at least one calculation unit configured to implement a mathematical model of an operation of the gas turbine. The mathematical model links a flow rate of a bleed system to (i) an ambient temperature and (ii) a rotation of adjustable vanes that control a fluid entering a compressor. The at least one calculation unit calculates the flow rate of the bleed system based on the ambient temperature and the rotation of the adjustable vanes such that the emissions are optimized during variations of operating conditions of a turbine over a range of external environmental conditions from approximately -29°C to +49°C.

In a non-limiting example, Figure 5 shows the at least one calculation unit 60 receiving as input the rotation of the adjustable vanes IGV and the ambient temperature 63.

As discussed in the specification, for example, at page 17, lines 3-11, the claimed system reduces the levels of polluting emissions by controlling the flow rate of the bleed system.

Turning to the applied art, Skowronski discloses a single shaft microturbine power generating system. Skowronski shows in Figure 1 a compressor 12 that provides

compressed air to a combustor 24, in which fuel is provided from a nozzle 28. The hot gas resulting from the ignition of the fuel is then provided to a turbine 14. Part of the compressed air from compressor 12 is provided directly to an auxiliary compressor 50 and a controller 42 controls a valve 52 that allows the part of the compressed air from compressor 12 to reach the auxiliary compressor 50.

However, Skowronski does not teach or suggest that controller 42 calculates a flow rate of a bleed system based on the ambient temperature and a rotation of adjustable vanes of the compressor, as recited by Claim 1.

The outstanding Office Action asserts on page 7, with regard to the features of Claim 2 (which features are now recited by Claim 1), that because Skowronski shows in Figure 1 ambient air entering a compressor 12, the control unit 42 calculates a flow rate of the bleed system based on the ambient temperature. However, Figure 1 shows the ambient air entering the compressor 12 and not a temperature of the ambient air being measured and being provided to control unit 42.

In addition, the outstanding Office Action does not indicate where it is disclosed in Skowronski that the control unit 42 receives information about the rotation of the vanes and calculates the flow rate of the bleed system based on the temperature of the ambient air and the rotation of the vanes as recited by amended Claim 1.

Accordingly, it is respectfully submitted that amended independent Claim 1 and each of the claims depending therefrom patentably distinguish over Skowronski.

Claim 1 is also rejected as being anticipated by Horii. Horii discloses a gas turbine that includes a compressor, a combustor and a turbine. Relying only on Figures 7 and 14 of Horii, the outstanding Office Action concludes that because these figures show an ambient temperature and adjustable vanes, a control unit 35 Horii must be configured as the claimed at least one calculation unit.

Horii repeatedly discloses injecting water into the gas to be supplied to the compressor to lower its temperature and for this reason, the control unit 35 receives information about various parameters (see paragraph [0155], "[s]ignals of a feed water quantity and a spray air quantity measured by the water flow meter 23 the [sic] and air flow meter 30 are transmitted to a control unit 35," or see paragraph [0174] "the control unit **35** sends an open operation signal to the feed water flow regulating valve 22 to increase its water spray quantity", see paragraph [0188] "in which signals of opening of the compressor inlet guide vanes are inputted in the control unit 35 and a water spray quantity is controlled according to the signals") and controls the water injection.

However, the control unit 35 of Horii has nothing to do with calculating a flow rate of a bleed system based on the ambient temperature and a rotation of adjustable vanes of the compressor, as recited by Claim 1.

Thus, it is respectfully submitted that amended Claim 1 and each of the claims depending therefrom patentably distinguish over Horii.

Accordingly, in light of the above discussion and in view of the enclosed amendments, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested. If, however, there are any remaining unresolved issues that would prevent the issuance of the Notice of Allowance, the Examiner is urged to contact the undersigned at (540) 361-2601 in order to expedite prosecution of this application.

Respectfully submitted,

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